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GUNDLACH, H. GERD, STEIN, WILLIAM H., AND MOORE, STANFORD. The Nature of the Amino Acid Residues Involved in the Inactivation of Ribonuclease by Iodoacetate 1754

GUNDLACH, H. GERD, MOORE, STANFORD, AND STEIN, WILLIAM H. The Reaction of Iodoacetate with Methionine. 1761

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BROWN, G. W., JR., AND COHEN, PHILIP P. Comparative Biochemistry of Urea Synthesis. I. Methods for the Quantitative Assay of Urea Cycle Enzymes in Liver 1769

BROWN, G. W., JR., BROWN, WILLIAM R., AND COHEN, PHILIP P. Comparative Biochemistry of Urea Synthesis. II. Levels of Urea Cycle Enzymes in Metamorphosing *Rana catesbeiana* Tadpoles 1775

SCHULMAN, MARTIN P., AND RICHERT, DAN A. The Oxidation of Glycine and Formate to CO_2 by Rat Liver Homogenates 1781

MUDD, S. HARVEY. The Mechanism of the Enzymatic Cleavage of *S*-Adenosylmethionine to α-Amino-γ-butyrolactone 1784

CIVEN, MORTON, AND KNOX, W. EUGENE. The Independence of Hydrocortisone and Tryptophan Inductions of Tryptophan Pyrrolase 1787

LUKENS, LEWIS N., AND BUCHANAN, JOHN M. Biosynthesis of the Purines. XXIII. The Enzymatic Synthesis of *N*-(5-Amino-1-ribosyl-4-imidazolylcarbonyl)-L-aspartic Acid 5'-Phosphate 1791

LUKENS, LEWIS N., AND BUCHANAN, JOHN M. Biosynthesis of the Purines. XXIV. The Enzymatic Synthesis of 5-Amino-1-ribosyl-4-imidazolecarboxylic Acid 5'-Phosphate from 5-Amino-1-ribosylimidazole 5'-Phosphate and Carbon Dioxide 1799

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HARTMAN, STANDISH C., AND BUCHANAN, JOHN M. Biosynthesis of the Purines. XXVI. The Identification of the Formyl Donors of the Transformylation Reactions. 1812

CHANG, M. L. WU, AND JOHNSON, B. CONNOR. *N*-Methyl-4-pyridone-5-carboxamide, a New Major Normal Metabolite of Nicotinic Acid in Rat Urine 1817

STROMINGER, JACK L., AND SMITH, MILDRED S. Uridine Diphosphoacetylglucosamine Pyrophosphorylase 1822

STROMINGER, JACK L., AND SMITH, MILDRED S. The Preparation of Uridine Diphosphoacetylgalactosamine 1828

TABOR, HERBERT, AND WYNGARDEN, LILLIAN. The Enzymatic Formation of Formiminotetrahydrofolic Acid, 5,10-Methenyltetrahydrofolic Acid, and 10-Formyltetrahydrofolic Acid in the Metabolism of Formiminoglutamic Acid 1830

ALTAMURA, MARIO R., LONG, LOUIS, JR., AND HASSELSTROM, TORSTEN. Goitrin from Fresh Cabbage 1847

TARDREW, P. L., AND JOHNSON, MARVIN J. The Distributuio of Sulfur-containing Compounds in Penicillin Fermentations 1850

WESTLEY, JOHN. A Comparison of Some Biochemical Properties of the Beef Liver and Beef Kidney Rhodaneses .. 1857

TANENBAUM, STUART W., AND BASSETT, EMMETT W. The Biosynthesis of Patulin. III. Evidence for a Molecular Rearrangement of the Aromatic Ring 1861

RAW, ISAIAS, AND MAHLER, H. R. Studies of Electron Transport Enzymes. III. Cytochrome b_5 of Pig Liver Mitochondria 1867

LANG, CALVIN A., AND NASON, ALVIN. A Triphosphopyridine Nucleotide-Cytochrome *c* Reductase from Heart Muscle 1874

VERNON, LEO P., AND ASH, OWEN K. The Photoreduction of Pyridine Nucleotides by Illuminated Chromatophores of *Rhodospirillum rubrum* in the Presence of Succinate 1878

VERNON, LEO P. Photooxidations Catalyzed by Chromatophores of *Rhodospirillum rubrum* under Anaerobic Conditions 1883

WESTERFELD, W. W., RICHERT, DAN A., AND BLOOM, ROBERT J. The Inhibition of Xanthine and Succinic Oxidases by Carbonyl Reagents 1889

WESTERFELD, W. W., RICHERT, DAN A., AND HIGGINS, EDWIN S. Further Studies with Xanthine Oxidase Inhibitors 1897

HOLLANDER, VINCENT P., AND STEPHENS, MARY L. Studies on Phenol-activated Oxidation of Reduced Nucleotides by Rat Uterus 1901

POLLARD, C. J., AND BIERI, J. G. Further Observations on the Effect of Isooctane on Respiratory Enzymes 1907

DELUCA, H. F., GRAN, F. C., REISER, S., AND STEENBOCK, H. Phosphate Inhibition of Citrate Oxidation in Kidney Tissue 1912

ZIEGLER, DANIEL M., GREEN, D. E., AND DOEG, K. A. Studies on the Electron Transfer System. XXV. The Isolation and Properties of a Lipoflavoprotein with Diaphorase Activity from Beef Heart Mitochondria... 1916

WINEGRAD, ALBERT I., SHAW, WALTER N., LUKENS, FRANCIS D. W., STADIE, WILLIAM C., AND RENOLD, ALBERT E. Effects of Growth Hormone *in Vitro* on the Metabolism of Glucose in Rat Adipose Tissue..... 1922

AUGUST 1959

DESHPANDE, W. M., AND RAMAKRISHNAN, C. V. Condensing Enzyme in Garcinia Leaves (*Xanthochymus guttiferae*)..... 1929

VOLK, WESLEY A. The Enzymatic Formation of D-Arabinose 5-Phosphate from L-Arabinose and Adenosine Triphosphate by *Propionibacterium pentosaceum*..... 1931

SEGAL, HAROLD L., AND WASHKO, MARY E. Studies of Liver Glucose 6-Phosphatase. III. Solubilization and Properties of the Enzyme from Normal and Diabetic Rats..... 1937

NEPTUNE, E. M., JR., AND FOREMAN, D. R. The Endogenous Glycogen of Rat Diaphragm and Its Theoretical Capacity to Support Respiration..... 1942

WARAVDEKAR, V. S., AND SASLAW, L. D. A Sensitive Colorimetric Method for the Estimation of 2-Deoxy Sugars with the Use of the Malonaldehyde-Thiobarbituric Acid Reaction..... 1945

VAN REEN, ROBERT. Metabolic Activity in Calcified Tissues: Aconitase and Isocitric Dehydrogenase Activities in Rabbit and Dog Femurs..... 1951

NIGAM, VIJAI N., SIE, HSIEN-GIEH, AND FISHMAN, WILLIAM H. The Natural Occurrence of Sedoheptulose Monophosphate in Liver..... 1955

HELMREICH, ERNST, AND EISEN, HERMAN N. The Distribution and Utilization of Glucose in Isolated Lymph Node Cells..... 1958

PAZUR, JOHN H., AND ANDO, TADAHIKO. The Action of an Amyloglucosidase of *Aspergillus niger* on Starch and Malto-oligosaccharides..... 1966

WARREN, LEONARD. The Thiobarbituric Acid Assay of Sialic Acids..... 1971

DITTMER, JOHN C., AND HANAHAN, DONALD J. Biochemistry of Long Chain Fatty Acids. I. General Observations..... 1976

DITTMER, JOHN C., AND HANAHAN, DONALD J. Biochemistry of Long Chain Fatty Acids. II. Metabolic Studies..... 1983

MOSER, HUGO W., AND KARNOVSKY, MANFRED L. Studies on the Biosynthesis of Glycolipides and Other Lipides of the Brain..... 1990

KENNEDY, EUGENE P., BORKENHAGEN, LOUISE FENCIL, AND SMITH, SYLVIA WAGNER. Possible Metabolic Functions of Deoxycytidine Diphosphate Choline and Deoxycytidine Diphosphate Ethanolamine..... 1998

SAZ, HOWARD J., AND VIDRINE, ARTHUR, JR. The Mechanism of Formation of Succinate and Propionate by *Ascaris lumbricoides* Muscle..... 2001

RYAN, KENNETH J. Metabolism of C-16-oxygenated Steroids by Human Placenta: the Formation of Estriol.... 2006

LEVY, H. RICHARD, AND TALALAY, PAUL. Bacterial Oxidation of Steroids. I. Ring A Dehydrogenations by Intact Cells..... 2009

LEVY, H. RICHARD, AND TALALAY, PAUL. Bacterial Oxidation of Steroids. II. Studies on the Enzymatic Mechanism of Ring A Dehydrogenation..... 2014

BERGSTRÖM, SUNE, LINDSTEDT, SVEN, AND SAMUELSSON, BENGT. Bile Acids and Steroids. LXXXII. On the Mechanism of Deoxycholic Acid Formation in the Rabbit..... 2022

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